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Title: India and Brazil in Pursuit of the Competitive Knowledge Economy

Abstract: The aim of this article is two-fold: firstly, it seeks to address the question of why the competitive knowledge economy orientation that emerged in certain economically-advanced states as a response to the crisis of Fordism came to be embraced by the Indian and the Brazilian state from the late 1980s onwards. Secondly, it aims to elucidate the manner in which the goal of becoming competitive knowledge economies has been articulated and implemented locally, especially from the mid-1990s onwards, by key fragments of the Indian and the Brazilian state. Drawing on insights from the competition state, regulation school, knowledge economy literature and that on India and Brazil, attention is paid to the context- and conjuncture-specific domestic and international factors that have contributed not only to the adoption of the competitive knowledge economy orientation, but also to the necessarily distinctive ways in which it found expression in practice in India and Brazil

Keywords: Competition state orientation, Competitiveness, Knowledge Economy, Institutional Reforms, India, Brazil

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India and Brazil in Pursuit of the Competitive Knowledge Economy

Starting in the 1970s in the more advanced parts of the world economy, a noticeable shift occurred in the locus of wealth creation away from productive activities towards the exploitation of knowledge and rents on financial and knowledge assets (e.g. intellectual property titles). ‘Financialisation’ and the ‘knowledge economy’ are two frequently used terms that capture these tendencies which, following the real and perceived crisis of Atlantic Fordism in the late 1970s and 1980s, emerged as the dominant strategies to address it. While financialisation has attracted considerable attention and criticism, the knowledge economy has many vocal supporters among whom the states are perhaps the most notable. Indeed, as this particular way of conceptualising and organising socio-economic activities became dominant in key advanced economies, states everywhere showed no immunity to its charms: it is difficult to find official policy announcements that do not make reference in one way or another to the advantages of becoming a knowledge economy and successfully competing in the global knowledge economy today. To make but a few examples, China has the ambitious goal of becoming an innovation-oriented country by 2020 and a world-leading science power by 2050;¹ India, becoming an innovative economy and one of the top five global knowledge powers by 2020;² South Korea, a ‘Second Miracle on the Han River’ on the basis of a creative economy;³ Mauritius, to transform itself into a knowledge hub;⁴ and Brazil, to become *the* great technological power of the 21st century.⁵

¹ Linda Jakobson, (Ed.) *Innovation with Chinese Characteristics: High Tech Research in China* (Basingstoke: Palgrave MacMillan)

² Government of India (2013) Science, Technology and Innovation Policy, Ministry of Science and Technology, New Delhi, available at <http://www.dst.gov.in/st-system-india/science-and-technology-policy-2013>

³ , Geun-hye Park (2013) ‘Opening a New Era of Hope (18th Presidential Inaugural

One of the consequences of the adoption of the competitive knowledge economy orientation by a great number of states around the world is the radically changed nature of global political economy whose record so far – despite great hopes associated with the rise of knowledge economy and liberalisation of capital and financial flows – has largely been one of low productivity and growth rates, multiple crises and increased societal tensions. While such record is justifiably the focus of much research in international political economy, the present article takes a step back and asks *why* and *how* a specific socio-economic strategy that emerged in the more advanced parts of the world economy came to be embraced as a state goal of first order in the lesser developed parts. Focussing on India and Brazil, it does so, firstly, by showing how the emergence of the competitive knowledge economy orientation in the more advanced regions of the world economy changed the playing field for states everywhere, and, secondly, by uncovering the distinct manner in which this orientation was adopted domestically by the Indian and the Brazilian state from the 1980s onwards. Attending to these questions is achieved through an analysis that, based on a conceptualisation of the state as being simultaneously anchored in the domestic and global terrain, pays attention to both domestic and global factors. In particular, it focusses on how the home-grown search for a new growth strategy in India and Brazil in the 1980s was shaped by the necessity of adapting to the altering horizon of what it means to develop in a global economy whose dynamics are constantly changing under the influence of more advanced economies. Instead of interpreting this influence as a structural inevitability, however, attention is paid to the context- and conjuncture-specific factors that contributed

Address)', 25 February, Office of the President, Republic of Korea, available at

<http://english.yonhapnews.co.kr/national/2013/02/25/95/0301000000AEN20130225001500315F.HTML>

⁴ Government of Mauritius (2006) 'Transforming Mauritius into a Knowledge Hub' Sectoral Committee Report, Ministry of Education & Human Resources, available at <http://www.hrdc.mu/index.php/publications/sectoral-committee-reports>

⁵ Lula da Silva (2007) Presidential Address (Discurso do Presidente da República, Luiz Inácio Lula da Silva, na cerimônia de lançamento da Política de Biotecnologia), Palácio do Planalto, Brasília, 8 February.

not only to the conscious adoption of this orientation, but also to the necessarily distinctive ways in which it found expression in practice in India and Brazil.

Among developing countries contemplating a new growth strategy in the changed context of the 1980s, India and Brazil (alongside China) stand out for being the first to embrace the competitive knowledge economy orientation. In addition to being among the first developing countries to move in this direction, it is noteworthy that their large, quasi-continental domestic market size could have afforded them – at least in principle – more room for manoeuvre as far as the option of developing alternative growth strategies was concerned. It is difficult to ascertain what would have been the nature of the world economy had they chosen to do so; what is clear, however, is that their early embrace of the competitive knowledge economy orientation contributed to expanding the reach of this particular way of organising socio-economic activities well beyond its origins in advanced economies. Although their adoption of this orientation in practice is distinctive – as will be seen, a mixture of emulative tendencies couched in a strong nationalist legitimising discourse – it has amounted not to a novel vision but instead to the further perpetuation of the exigencies of the competitive knowledge economy orientation to other parts of the world economy. These exigencies are many and demand that the state plays a rather active if different role to the past. As they cannot be satisfactorily dealt within the scope of this article, attention is paid to perhaps the two most crucial tasks states like India and Brazil must play in pursuit of becoming competitive knowledge economies, namely creating and maintaining the necessary conditions for knowledge circulating as a commodity/capital and successfully propagating a societal and political vision that pivots on excelling in the global competitiveness race.

Both changes in states' role towards meeting the exigencies of the competitive knowledge orientation in general and the two specific tasks highlighted here are discussed in more detail in the first section of the article. This analysis is embedded in a wider conceptual analysis offered in this section which is preoccupied, broadly speaking, with understanding

the emergence of the competitive knowledge economy orientation in the more advanced parts of the world economy and how it changed the playing field for states everywhere. It both relies on insights generated by the regulation and the competition state approaches and seeks to enrich them by turning attention to transformations in state forms outside the advanced parts of the world economy that have been their main preoccupation so far. The distinctive manner in which the competitive knowledge economy orientation was embraced, articulated and attempted domestically by the Indian and the Brazilian state from the late 1980s onwards is discussed in two parts: the second section discusses the concrete domestic and international conditions that led to the search for a new growth regime in both India and Brazil, as well as the choice made by the state in both countries to embrace the new orientation in the mid-1980s and early 1990s. The key argument here is that while the changed dynamics of the global economy certainly shaped such choice, the adoption of the competitive knowledge economy orientation was a conscious decision on the part of the state in both countries. Of particular note here is also the way in which this new orientation, although not autochthonous, was and continues to be legitimised by a broader societal vision imbued with strong nationalist and even exceptionalist tones. The tensions between a strong nationalist legitimising discourse and the emulative character of the institutional reforms undertaken to realise the new orientation are highlighted in the third section. In particular, this section focusses on reforms most closely related to the central state task of creating the conditions for knowledge to function as commodity and capital; it does so not only because such conditions are deemed crucial for becoming a successful competitive knowledge economy, but also to demonstrate concretely how the new state orientation pushed both the Indian and the Brazilian state towards remaking their respective socio-economic structures in accordance with the new exigencies of participating in the changed world economy.

There exists by now a sizeable and growing body of literature on the specific measures or reforms undertaken by the state in India and Brazil towards achieving the knowledge economy status (e.g. various science and technology policies, R&D investment, changes to

the domestic intellectual property regime, innovation policies, etc.). Nevertheless, this literature tends to take the competitive knowledge economy orientation for granted and its focus on specific policies often comes at the expense of providing a comprehensive picture of how such policies are interlinked and, importantly, are constitutive of a broader political state project which is itself embedded in and shaped by changes in the global economy. Similarly, the literature discussing changes in economic direction in India and Brazil during the 1980s and 1990s tends for the most part to focus on the restructuring of the economy along neoliberal lines at the expense of stressing these states' adoption of the competitive knowledge economy orientation and of the institutional reforms invoked towards this end.

Adopting a theoretically-informed mode of analysis that pays attention to both the structuring effects of changed competitive dynamics in the global economy and to state agency in the case of India and Brazil, the present article links and builds upon these often-separate bodies of literature in an attempt to offer a deeper understanding of the reasons for and manifestations of the changed orientation of these two important states. In addition, the analysis also invites reflections on some of the consequences this new orientation has had on the broader nature of global political economy, including their chances – and perhaps that of other developing countries – of succeeding in it. As noted briefly in the concluding section, alternative, heterodox orientations are not only possible but also necessary, for the closer the Indian and the Brazilian state emulate what they perceive to be the winning strategy, the more they may be weakening the chances of successfully realising the still-elusive promise of the knowledge economy.

1. The rise of the knowledge economy and of the competitive state orientation

The most sophisticated accounts of the trajectory of the capitalist state in the post-war period and its moment of punctuation in the crisis of the 1970s are those inspired by Philip Cerny's work on the rise of the 'competition state' and that of Bob Jessop's on the rise of the 'Schumpeterian Workfare State' orientation, among others.⁶ Broadly speaking, this literature captures how the welfare state orientation in economically-advanced countries was supplanted by the (Schumpeterian) competition orientation as a result of various pressures stemming from the real and perceived nature of the crisis of Fordism during the 1970s and 1980s. Despite the close connections between this approach and the regulation approach⁷ to which influential theorists of the competition state like Jessop are strongly connected, there has not been a robust dialogue between the two, occluding the fact that the competition state may be the political form closest to the unstable post-Fordist growth regime that preoccupies the regulationist project.⁸ Although it contributes to such a dialogue, turning to and synthesising insights from both approaches in what follows is primarily aimed at helping address the questions at hand, i.e. why the competition state orientation was embraced by the state in India and Brazil and how this orientation has been articulated domestically to date.

⁶ E.g. Philip Cerny, 'Paradoxes of the Competition State: The Dynamics of Political Globalization' *Government and Opposition*, 32 (1997), pp. 251–274, and 'Globalisation and the Changing Logic of Collective Action' *International Organization* (1995), pp. 595–625; Bob Jessop, 'Towards a Schumpeterian Workfare State? Preliminary Remarks on Post-Fordist Political Economy' *Studies in Political Economy* 40 (1993), pp. 7–40, and *The Future of the Capitalist State* (Cambridge: Polity, 2002). See also Ronan Palan and Abbott, J with Deans, P. *State Strategies in the Global Political Economy* (London: Pinter, 1996).

⁷ This approach emerged as a way of making sense of the challenges that the crisis of the 1970s posed to the Fordist growth regime in key advanced economies; for a primer, see Robert Boyer, *The Regulation School: A Critical Introduction* (New York: Columbia University Press, 1990).

⁸ Ronen Palan, 'Is the Competition State the New, Post-Fordist Mode of Regulation?' *Competition & Change* 10 (2006), pp. 246–262.

Since the start we are faced with the difficulty stemming from the fact that, being primarily concerned with the trajectory of the state in advanced economies, neither the competition state nor the regulation approach has had much to say regarding the trajectory of state forms in the developing world; their different socio-economic conditions and mode of integration in the world market made them unlikely exemplars of the Keynesian Welfare State form during Fordism, or the (Schumpeterian) Competition State form now.⁹ Beyond the assertion that each state is distinct and must be studied in its own right – and the expectation that the competition state orientation will find different expressions in practice – neither approach offers off-the-shelf tools to explain the concrete ways in which the Indian and the Brazilian state have embraced this orientation in practice. This said, undertaking this very task in section two and three is greatly facilitated by these approaches' insights in at least three aspects. Firstly, insights on the shift towards the competition state orientation in advanced economies provide a necessary first step towards understanding the main tendencies and pressures this orientation generated in the global economy that, in turn, altered the terrain where developing countries like India and Brazil operate and seek to succeed. Although there was nothing inevitable about the rise of this orientation in key advanced economies or its embrace by states like India and Brazil, both approaches stress that such domestic developments always take place against the backdrop of important changes in the global dynamics of capitalism.¹⁰ Secondly, and especially important for our purposes, both pay particular attention to the changed nature of the institutional form of competition in the global economy from the late 1970s onwards¹¹ which, as we shall see shortly, goes some way towards explaining why the state in India and Brazil reacted to the collapse of their previous growth regimes in the 1980s by embracing the competitive state orientation. Thirdly, and related, this is not any competitive state orientation, but a specific form that relies heavily on

⁹ Exceptions exists, e.g. see Palan & Abbott, *State Strategies*.

¹⁰ This is especially true of certain streams of the regulation approach; see Palan, *The Competition State*.

¹¹ This is obviously central to the competition state literature, but also to the regulationist one; see, for instance, Boyer, *The Regulation School*.

perpetual innovation and on the competitive advantage to be gained in the new knowledge economy. These three key contributions are unpacked further below.

The concomitant rise of the knowledge economy and of the competitive state orientation – what is referred to here as the competitive knowledge economy orientation – from the late 1970s onwards was emphatically not an innovation on the part of ambitious catch-up contenders like India and Brazil, but bore the historically- and contextually-specific marks of its emergence in the US, perhaps the better-studied case in both the competition state and regulationist approaches. While the details of the rise of the competitive knowledge economy orientation as a state project in the US need not detain us here, certain elements are worthy of note because of the impact they have had on the broader dynamics of competition in the global economy and because of the powerful emulative pull key transformations in the US would have for the Indian and Brazilian state later on. Notably, it was initially in the US during the 1970s that, against a background of a growing trade deficit, economic stagnation and the intensifying competitive threat by Japan and other East Asian countries, international competitiveness – especially competitiveness based on knowledge and innovation – migrated from the business world and placed itself at the centre of state concerns, on par with national security and as the reference point for other state policies.¹² Ideas about the emergence of a ‘new economy’ – variously labelled a knowledge, information or post-industrial economy – whose sources of wealth were to be found in the manipulation of information and knowledge had started to command growing attention in various US circles since the 1960s¹³ and appeared to be vindicated by the arrival of the Digital Revolution of the 1970s and 1980s. Nevertheless, the reordering of US state’s priorities at the time had less to do with the merits of such ideas than with the success of key political

¹² Linda Weiss, *America Inc.* (Ithaca: Cornell University Press, 2014); Tore Fougner ‘The State, International Competitiveness and Neoliberal Globalisation’, *Review of International Studies* 32 (2006), pp. 165-185; François Chesnais, “Technological Competitiveness Considered as a Form of Structural Competitiveness” in Jorge Niosi, (Ed.) *Technology and National Competitiveness* (Montreal: McGill-Queen’s University Press, 1991), pp. 142-176.

¹³ Jane Kenway *et al.* (Eds), *Haunting the Knowledge Economy* (London: Routledge, 2006).

actors in juxtaposing the stagnation of more traditional industrial sectors and the broader crisis of Fordism with the considerable advantage the US enjoyed in the new technologies of the 1970s and 1980s to justify the shift towards the competitive knowledge economy orientation.¹⁴ Because discursivity and materiality constitute each other, this vision was central in guiding the adoption of practices that over time contributed to the instantiation of the knowledge economy in practice. In this respect, the knowledge economy was a state project, in that it provided a more or less coherent direction for US' state policy in different areas aimed at establishing the necessary socio-economic conditions on which it could be secured in practice.¹⁵

Establishing such conditions required not only a whole raft of institutional reforms at home, but also reforming international rules regarding, among others, trade, finance and, especially important for a growth regime based on the commodification of knowledge, intellectual property (IP), with a view to simultaneously improving the international competitiveness of the US economy and laying out and locking-in the free-market foundations of the world economy. These changes were helped in no small measure by the rapid spread of concerns with international competitiveness from the US to various Western European countries and the EU¹⁶ – numerous state commissions on competitiveness were established across the Atlantic whose output joined that of various research institutes, think tanks and academia to create a veritable flood with no signs of abating as of yet – accompanied simultaneously by the official embrace of the 'information society' and of the 'knowledge economy' vision by the OECD.¹⁷ While the competitive knowledge economy orientation found different expressions in other advanced economies in line with their variegated socio-techno-economic conditions and balance of political forces, it nonetheless pushed them to engage alongside the US in

¹⁴ Mazzucato, *Entrepreneurial State*; Weiss, *America Inc.*

¹⁵ Bob Jessop, 'The Knowledge Economy as a State Project' in M. Böss, *et al.* (Eds.) *The Nation-State in Transformation* (Santa Barbara: Aarhus University Press, 2010), p. 110- 129.

¹⁶ Fougner, *International Competitiveness*; Author (2013)

¹⁷ Benoît Godin, 'The Knowledge-Based Economy: Conceptual Framework or Buzzword?' *Journal of Technology Transfer*, 31 (2006), pp.17-30.

efforts to redesign various international policy regimes in ways that sought to enhance the competitiveness of their economies.¹⁸

The (variegated) adoption of the competitive knowledge orientation in key frontier states and concomitant changes attempted and/or achieved across many international policy regimes could not but alter the dynamics of the world economy and hence the field within which all states operate. Because states have always been spatially Janus-faced – looking both inwards and outwards – and anchored simultaneously in the national and the global terrain, the pressures emanating from the shift towards the competition state orientation reaching states elsewhere had as much to do with the (neoliberal) nature of this shift as with the mutually constitutive nature of the national and the global: the state made the world economy and the world economy made the state.¹⁹ It is this structural and spatial feature of the modern state – yet to be claimed by another actor – that grants it among other things the capacity to make and remake its domestic socio-economic structures in response to changes in the world economy. This does not mean that the state is a unitary actor that singlehandedly lays out and pursues a new growth regime, but that in its continuous drive to adapt and respond simultaneously to internal and external pressures, it remains one of the central agents that shapes domestic and international institutional forms.²⁰ While state forms everywhere have always been historically-specific expressions of domestic pressures and, simultaneously, of the workings of the world economy, it could be argued that state forms in the developing world are – in light of their relatively subordinate position – even more directly shaped by the changing terms of competition in the world economy.²¹

¹⁸ Bob Jessop, 'The state and the contradictions of the knowledge-driven economy' in John Bryson, *et al.* (Eds.) *Knowledge, Space, Economy* (London: Routledge, 2000), pp. 63-78; Brand et al., *Internationalisation of the State*.

¹⁹ John Hobson *The Wealth of States: A Comparative Sociology of International Economic and Political Change* (Cambridge: Cambridge University Press, 1997).

²⁰ Hobson, *The Wealth of States*; Jessop, *The state and contradictions*.

²¹ Bruce Cumings, 'Webs With no Spiders, Spiders with no Webs: the Genealogy of the Developmental State' in Meredith Woo-Cumings (Ed.), *The Developmental State* (Ithaca: Cornell University Press, 1999).

What of the changed terms of competition in the world economy? Here, again, insights from the competition state and regulationist approaches are indispensable. Although no state comes close to the ideal competition state form – and considerable variations exist in practice – it is possible to tease out from these approaches the main tendencies of the competitive state orientation as it emerged in the late 1970s and 1980s in key advanced economies. Key among them is gaining and maintaining international competitiveness having become the principal state priority. This orientation implies a noticeable reordering of state priorities away from welfare rights, redistributive policies and the use of a range economic tools in a relatively closed national economy, towards economic and social objectives that prioritise the promotion of innovation, the enhancement of structural competitiveness in a relatively open economy and the subordination of social policies to the demands of labour market flexibility, innovation, entrepreneurship, cost-saving concerns and profit maximisation. Put differently, the state no longer views the national economic space as the best starting point for pursuing economic growth but manages instead its insertion into global circuits of capital through a combination of extraversion and penetration.²² This orientation, in turn, necessitates that the state itself becomes re-constituted as a competitive entity; it no longer is only concerned with improving the chances of ‘national’ firms succeeding in global markets, but increasingly with providing within its territory the necessary socio-economic conditions to attract and retain investment and financial capital in competition with other states attempting the same.²³ This kind of competitiveness – compelling states to self-discipline and ‘sell’ themselves as an attractive location for investment – not only perpetuates states’ orientation as competitive entities, but it also propagates a global economy whose institutional arrangements are geared towards guaranteeing the freedom of market actors.²⁴

²² Cerny, *The Competition State*; Jessop, *The Capitalist State*.

²³ Fougner, *International Competitiveness*; Palan & Abbott, *State Strategies*.

²⁴ David Harvey, *A Brief History of Neoliberalism* (Oxford: Oxford University Press, 2005).

Here, the distinctive features of the terms of the competitiveness such as they came to be instituted in the post-Fordist period become apparent. There is, after all, nothing new in making the observation that states orient their policies in pursuit of competitive advantages in the global marketplace: the drive towards competitiveness – differently constituted in time and place – is a structural feature of the modern state. Neither is the coupling of this drive to knowledge new; both mercantilist and Keynesian states pursued it, as evidenced, for instance, in measures limiting the outflow of skilled labour and machinery taken by the former and in the massive public investment in sciences and higher education by the latter.²⁵ But while the state has historically been formed and transformed by international competition in the world market,²⁶ the ‘international competitive treadmill’²⁷ that has characterised the shift towards post-Fordism places specific demands on states. Of these, the most notable among key advanced economies has been strengthening one’s *technological structural competitiveness*, understood as Schumpeterian competitiveness oriented towards entrepreneurship and innovation on the one hand, and as the global efficiency and strength of national economic productive structures on the other.²⁸

Of note here is how the exigencies of structural competitiveness overlap with those of the knowledge economy that emerged as the dominant strategy of dealing with the crisis of Fordism initially in the US and later elsewhere. Specifically, innovation-driven structural competitiveness is seen to depend as much on economic factors as on non-economic institutional factors and socio-cultural conditions that have a bearing on economic performance which is why, as the shift away from Keynesian welfare regimes demonstrates, societal regimes have increasingly become subordinated to the pursuit of competitive

²⁵ John Harris, *Industrial Espionage and Technology Transfer* (Aldershot: Ashgate, 1998); Suzanne Borrás, ‘Innovation Policy and Institutional Competitiveness’, in P. Nedergaard and J.L. Campbell (eds) *Institutions and Politics*, (Copenhagen: DJØF Publishing, 2008), p. 53-72.

²⁶ Hobson, *The Wealth of States*; Cumings, *The Developmental State*.

²⁷ Jessop, *Schumpeterian Workfare State*.

²⁸ Chesnais, *Structural Competitiveness*.

advantages in the global market.²⁹ But this is not all; because the technological and societal orders are mutually constituted, a strategic concern with promoting innovation requires the state to become more involved in harnessing non-commodity forms of social relations in the service of structural competitiveness.³⁰ In turn, this requires the appropriation of an even-larger share of society's comprehensive productive powers that include not only direct labour but human creativity in general and, importantly, the collective social processes in which it is embedded and reproduced.³¹ This particular trait, i.e. value and competitive strength being derived not strictly from the factory of old but from the much larger 'social factory',³² is the essence of the knowledge economy whose concomitant rise with the competitive state orientation initially in the US would soon be adopted in some form or another by a great number of states.

Highlighting the structuring effect of the rise of this orientation in no way eliminates agency. On the contrary, its embrace on the part of other states was neither inevitable nor planned but the outcome of processes of cumulative causation in specific contexts. As will be discussed in case of India and Brazil, both states – or rather key fragments within them – were not only keenly aware of changes occurring in the global economy but chose as their new growth strategy one based on innovation-led competitiveness (although lower value-added sectors have not been not excluded). As will be seen, their embrace of the competitive knowledge economy orientation constitutes a clear break with their previous state orientation. This reorientation, in turn, demands that these states do more rather than less; the complex list of tasks facing competition states everywhere includes, besides adhering to neoliberal macroeconomic tenets, increasing labour market flexibility, reforming the terms of pre-competitive firm relations, investing in R&D, education, research infrastructure and

²⁹ Bob Jessop, 'What follows Fordism?', in R.M. Albritton, *et al* (Eds.) *Phases of Capitalist Development: Booms, Crises and Globalizations* (Basingstoke: Palgrave, 2001), pp. 282-299.

³⁰ Ulrich Brand, Christoph Görg, *et al.*, *Conflicts in Environmental Regulation and the Internationalisation of the State: Contested Terrains* (London: Routledge, 2008); Jessop, *Fordism*.

³¹ Tessa Morris-Suzuki, 'Capitalism in the Computer Age' *New Left Review*, 160 (1986), pp. 81-91.

³² Neil Smith (2007) 'Nature as Accumulation Strategy' *Socialist Register* 43 (2007), pp. 1-21, at 13.

other elements contributing to the long-term generation of social knowledge while simultaneously submitting it to short-term economic calculations, creating new markets, changing the terms of finance's engagement in knowledge markets, reforming intellectual property (IP) rules and so on, all undertaken with a view to actively foster and bolster the market, accompanied, importantly, by efforts to build consensus for the new growth regime and the many changes deemed necessary to attain it. Competition states would face and attempt to attend to these tasks differently, but none can afford to ignore them if they are to succeed in the global market. Of these complex tasks, two are of particular interest to our argument: creating and maintaining the necessary conditions for the production and circulation of knowledge as commodity/capital, and that of successfully propagating a broader societal and political vision that pivots on winning or excelling in the global competitiveness race. Regarding the former, both the Indian and the Brazilian state have often tended to emulate the spirit and sometimes the form of institutional reforms undertaken in what they perceive to be the most successful knowledge economy, the US. Regarding the latter, however, the legitimating discourses of becoming competitive knowledge economies are distinctive and strongly embedded in nationalist sentiments that are specific to India and Brazil.

While this curious mixture of exceptionalist and emulative tendencies will be explored more concretely in the following sections, more needs to be said here about the general nature of these two key tasks the competition states face today. Starting with the task of maintaining the necessary conditions for knowledge to function as commodity/capital, as noted earlier, the competitive knowledge economy orientation demands a much more extensive and intensive mobilisation of economic and non-economic resources in the service of perpetual innovation. What sets the contemporary knowledge economy apart from previous formations is not that they were not knowledge-based, but that the conditions for the generation and use of knowledge have been transformed: knowledge has become a fictitious

commodity in the proper Polanyian sense.³³ The commodification of knowledge started since the modern state sanctioned and guaranteed intellectual property (IP) titles from the 15th century onwards, a development that by disembedding knowledge from its collective roots and granting control over valuable knowledge to private IP-holders alone laid the foundations of what would eventually become markets for knowledge ‘goods’.³⁴ But the more wealth creation became dependent on the exploitation of knowledge from the 1970s onwards, the more important the role of IP titles in protecting the competitive advantage of IP-holders became, which is why the US state first and other advanced states soon after moved to create a binding global IP regime through the 1994 WTO TRIPS Agreement. One tangible outcome of this policy regime change has been that of the estimated US\$318 billion in worldwide receipts for the use of IP titles such as patents, copyrights and trademarks in 2015 – up from under US\$10 billion (current US\$) in 1980 – around 88% accrued to IP-holders in the US, the EU and Japan.³⁵ Apart from the highly skewed nature of the global knowledge economy, these figures illustrate the fact that knowledge does not only function as a fictitious commodity, but also as a fictitious asset/capital because regular income streams or ‘rents’ from knowledge are guaranteed by stronger IP titles that, moreover, can also be sold and bought independently in the market.³⁶

Starting in the US, the deeper transformation of knowledge into a fictitious commodity and capital was achieved in large part through the radical redrawing of boundaries between public and private knowledge via reforms of the IP regime and of the role of universities and public research institutes among other things, reforms that, as will be seen in the third

³³ Morris-Suzuki, *Capitalism*; Bob Jessop ‘Knowledge as Fictitious Commodity’ in Ayse Bugra (Ed.) *Reading Polanyi for the 21st Century* (Basingstoke: Palgrave Macmillan, 2007), pp. 115-134.

³⁴ James Boyle, ‘The Second Enclosure Movement and the Construction of the Public Domain’ *Law and Contemporary Problems* 66 (2003): pp. 33-74.

³⁵ World Bank, World Development Indicators database, available at <http://data.worldbank.org/indicator/BX.GSR.ROYL.CD>; Bryan, D., *et al.* ‘Capital unchained: finance, intangible assets and the double life of capital’, *Review of International Political Economy*, 24: 1 (2017), pp. 56-86, at p. 61.

³⁶ Benjamin Coriat and Geneviève Schméder, ‘Post-Fordism in a more globalized capitalism’, in P. Coriat, P. Petit and G. Schméder (Eds.) *The Hardship of Nations* (Cheltenham: Edward Elgar, 2006), p. 311-340.

section, would also be attempted by the Indian and the Brazilian state following their reorientation in the 1980s and 1990s. Undertaking these and other reforms requires the state to maintain a truth regime that not only legitimises them, but the entire competitive knowledge economy orientation on whose name they are invoked. While the state's crucial task of propagating a broader societal and political vision that pivots on excelling in the global competitiveness race has been noted in the literature on the trajectory of advanced states,³⁷ a focus on the latter has occluded the distinct ways in which such visions have found expressions in developing states such as India and Brazil. As will be seen shortly, one of the distinctive features of the Indian and Brazilian knowledge economy state projects is the manner in which hopes of becoming competitive knowledge powers have been co-articulated and fused with strong nationalist overtones. Nationalism tends to operate as a key social mechanism through which the state copes with the internal and external processes of legitimising existing or changing socio-economic systems;³⁸ this said, in developing countries nationalism is profoundly shaped by a historical consciousness of lack and lag that makes it much more sensitive to one's standing *vis-à-vis* other nations and states.³⁹ Both the Indian and the Brazilian states, for instance, systematically exploited nationalism to generate popular support and legitimation for their respective growth strategies during the late 1940s - early 1980s period with the unequivocal aim of catching-up with advanced economies. To some extent, therefore, it is not surprising that their new orientation adopted at the turn of the century should also be legitimised on a nationalist vision of transforming India and Brazil into 'knowledge powers' competing and succeeding in the global market. For a growth strategy based on innovation and structural competitiveness for which even higher levels of socio-economic mobilisation are required, a hopeful vision is correspondingly more indispensable. Indeed, the particular legitimising visions of succeeding as knowledge powers

³⁷ See, for instance, Brand, *Internationalisation of the State*.

³⁸ Andreas Pickel, "Explaining, and explaining with, economic nationalism", *Nations and Nationalism*, 9 (2003), pp. 105–127

³⁹ Gunnell Cederlöf and K. Sivaramakrishnan, *Ecological Nationalisms: Nature, Livelihoods, and Identities in South Asia* (Seattle, WA.: University of Washington Press, 2006).

in the global marketplace are underpinned and further enhanced by these countries' distinct versions of exceptionalism: *regaining* its world power status in the case of India, and finally reaching the great power status its size and natural wealth has bestowed it in the case of Brazil.

2. 'Going out in the world and winning'

The responsibility for a country's economic performance post-WWII was everywhere placed on the shoulders of the state, especially in developing countries where catching-up with more advanced economies often became the basis of state's legitimacy and the justification for the radical, if uneven, social transformations deemed necessary to achieve this goal. Up until the late 1970s and early 1980s, in their drive to develop and catch-up with advanced economies, the Indian and the Brazilian state placed import-substitution industrialisation (ISI) at the heart of their growth regimes. Although these regimes and the socio-economic contexts in which they were embedded are too different to do justice here, a number of shared features can be highlighted for our purposes. First, ISI strategies were not independent of, but mirrored, if only partly, the Fordist growth mode in at least two respects: in their general thrust towards building both upstream and downstream industrial sectors capable of serving and strengthening domestic markets, and in the crucial role the state had to play in engineering and achieving economic development through industrialisation, ostensibly in the name of the nation as a whole. That the Indian and the Brazilian states went about it in different ways – e.g. in a much more inward-looking manner in India than in Brazil – is a function of their socio-politico-economic and historical idiosyncrasies and not of the state in either pursuing a heterodox growth regime. A second feature is that the state in both was

predominantly concerned with achieving economic growth which meant that in practice it made only limited advances in providing the distributional, welfare and social protection systems that accompanied the Fordist growth regime in frontier economies.

Third, like their Keynesian counterparts in advanced economies, both states had understood well the importance of scientific and technological (S&T) knowledge for economic development and both invested early on their S&T bases that today are among the most impressive in the developing world. India's post-colonial state gave S&T a privileged role in *remaking* India a great power, investing considerable amounts of public funds in 'big science', scientific R&D and in a number of high-tech sectors – although, importantly, not in basic education – investments that were unusually high for a country with relatively high poverty and illiteracy rates, but fully in line with the state's ambition of promoting India's industrial development and its rise to greater global prominence.⁴⁰ Likewise, benefitting from large public investments from the early 1950s onwards, a significant S&T base had been built in Brazil by the 1980s whose strength was most visible in a number of excellent public universities and research institutes in the field of agriculture and aeronautics, among others.⁴¹ Not having a similar past to invoke, it was towards becoming the great power its size and natural wealth had bestowed Brazil that motivated in part state's efforts in this and other fields.⁴² But, as in India, investment in S&T in Brazil was selective in nature and in both countries accompanied by the comparative neglect of universal basic education.

The most significant outcomes of industrialisation strategies and investment in S&T post-WWII in India and Brazil can be roughly summarised thus: (a) by 1980, they had succeeded

⁴⁰ Jalal Alamgir, *India's Open-Economy Policy: Globalism, Rivalry, Continuity* (Abingdon: Routledge, 2009); V. V. Krishna, "India" in Mario Scerri and Helena M. M. Lastres (Eds.) *BRICS National Systems of Innovation: the Role of the State* (New Delhi: Routledge, 2013), pp. 138-187.

⁴¹ Simon Schwartzman, *Science and Technology Policy in Brazil: A New Policy for a Global World* (Rio de Janeiro: Fundação Getúlio Vargas, 1995).

⁴² On Brazil as the 'land of the future' see, among others, José M. Carvalho, "Dreams Come Untrue" *Daedalus* 129: 2 (2000), pp. 57-82

in creating a relatively significant industrial base, accounting for around 44% and 24% of total GDP in Brazil and India, respectively;⁴³ (b) nevertheless, the application of technology and the resulting degree of competitiveness varied greatly within and between their respective industrial bases, with high-tech sectors accounting for a relatively small share of manufactures;⁴⁴ (c) and, in both countries, considerable S&T investment had generated a rather uneven base marked by only a few ‘pockets of excellence’ largely in public hands: atomic research, space technology and defence in the case of India, and aeronautics, agricultural research and petrochemicals in Brazil.

This growth regime came to an end for both India and Brazil in the early 1980s. In the case of Brazil, the end came more abruptly and was closely related to the debt crisis of 1982, while changes had been in the making in India since 1980 and progressed gradually until the so-called ‘big bang’ reforms of 1991. Among the many external factors contributing to this change, the debt crisis is noteworthy because one of its main consequence was that of pushing affected countries to rely less on borrowing as a source of funding and rather more on attracting international capital flows for which a new state orientation was required. As it happened, the impetus that led to its eruption – the considerable interest rate hikes by the US Treasury – also had the effect of channelling considerable financial flows towards wealthier regions of the world economy where they would further consolidate ongoing processes of financialisation.⁴⁵ Worthy of note is the how thanks to relaxed rules in the (US) stock exchange market and government’s own T-bonds, some of these flows went to finance the new sectors where the technologies of the Digital Revolution had taken hold and whose rising expenditures in intangibles required not only stronger IP protection and access to

⁴³ Alberto Rodriguez, *Knowledge and Innovation for Competitiveness in Brazil* (Washington: World Bank Publications, 2008); Arvind Panagariya, ‘India in the 1980s and the 1990s: A Triumph of Reforms’ in: Wanda Tseng and David Cowen (eds), *India’s and China’s Recent Experience with Reform and Growth* (London: Palgrave Macmillan, 2005), pp. 170-200.

⁴⁴ For Brazil, for instance, see Carmen A. Feijo and Marcos T. Lamônica, ‘The Importance of the Manufacturing Sector for Brazilian Economic Development’ *CEPAL Review*, 102 (2010), pp. 7-26; for India, see Krishna, *India*.

⁴⁵ Harvey, *Neoliberalism*.

wider markets globally, but also new international rules that would enable them to shape the terms of competition, and much else, in such markets.

In addition to changes to international policy regimes along these lines attempted from the 1980s onwards, the opening of developing countries' markets previously protected and/or controlled by domestic or public companies was achieved to a large extent through the structural adjustment programmes whose primary goal was that of extending and locking-in the new neoliberal foundations of the world economy. What is of interest for our purposes is that not in all cases was the attendant renegotiation of the private-public, economic-noneconomic and national-international boundaries – in favour of private market players, increased commodification and the dethroning the national economic space as the primary focus – resisted by the states concerned. This was the case of India and Brazil. It was certainly true that as a major debtor state, the protracted structural adjustment period that included no less than eight different plans for monetary stabilisation and over 20 proposals to renegotiate foreign debt had a significant influence in the subsequent orientation of the Brazilian state. But, importantly, significant changes occurring in advanced economies had already made the need for the competitive restructuring of the Brazilian economy a particularly pressing task among the country's elite, especially in influential networks around the BNDES,⁴⁶ the Society for the Advancement of Science, and IEDI.⁴⁷ Taking their cues from advanced economies, one of the steps taken by the new civilian government in its first year (1985) was to create the Ministry of Science and Technology that placed innovation on the policy agenda for the first time in Brazil, followed a year later by the creation of a special group to recommend a new growth strategy: it eventually pronounced the ISI strategy defunct, proposing instead an orientation towards *structural competitiveness* and the

⁴⁶ BNDES is Brazil's influential National Economic and Social Development Bank.

⁴⁷ IEDI is the Institute of Studies for Industrial Development, a think-tank based in São Paulo with strong links to the main national manufacturing firms. Marília B. Marques, "Gestão, planejamento e avaliação de políticas de ciência e tecnologia: hora de rever?" *Ciência & Saúde Coletiva*, 4:2 (1999): 383-392.

dynamic insertion of Brazil in the world economy.⁴⁸ Structural competitiveness, like in advanced economies, necessarily required changes in the productive structure towards higher levels of technological sophistication and innovation because competitive insertion, as President Fernando Henrique Cardoso later put it, “means insertion with knowledge... our future will depend on our capacity to advance systematically towards this goal”.⁴⁹

That this shift in orientation was predominantly a Brazilian affair and, importantly, a state project, is evident in the fact that this orientation was not only not abandoned but further strengthened from the mid/late 1990s onwards, when economic growth picked up and the painful memory of structural adjustment programmes receded in the distance. Fernando Henrique Cardoso – the finance minister and later the president whose administrations would oversee the most significant institutional reforms of the 1990s and early 2000s – made no secret that his Knowledge Society Project, strongly emphasising the necessity of transforming socio-economic structures through the application of science, technology and innovation, was a ‘national project for a new Brazil’ and he none other than the articulator of the ‘new Brazilian state’ that would achieve it.⁵⁰ The new orientation cannot be dismissed as merely rhetorical; not only were a raft of institutional reforms undertaken in its name, but it strengthened considerably during the subsequent PT era (*Partido dos Trabalhadores*, 2003-2016). During the latter, the vision of Brazil as a great knowledge power inserted and successfully competing in world markets became more dominant, helped in no small measure by the restoration of industrial policy as a legitimate state tool towards achieving it.

⁴⁸ José E. Cassiolato and Hubert Schmitz (Eds.), *Hi-Tech for Industrial Development: Lessons from the Brazilian Experience* (London: Routledge, 1992); Marques, *Ciência e Tecnologia*.

⁴⁹ Fernando Henrique Cardoso, “O Brasil a caminho da sociedade do conhecimento” in João P. Velloso (ed) *O Brasil e a Economia do Conhecimento* (J. Olympio, Rio de Janeiro, 2002).

⁵⁰ Fernando Henrique Cardoso, *Discurso do presidente da República na cerimônia de apresentação do "Avança Brasil": Plano Plurianual 2000/2003 e do Orçamento da União para o ano 2000*, Palácio do Planalto, Brasília; FHC in 2003, in João Biehl, “The Activist State: Global Pharmaceuticals, AIDS and Citizenship in Brazil” *Social Text* 22: 3 (2004): 105-132, p. 114.

The first industrial policy⁵¹ launched soon after the PT came in power made clear that the world economy was “characterised by new economic dynamics...that see innovation as the key element for national industrial and competitive growth”.⁵² Since then, all industrial and S&T policies emphasised without fail the importance of scientific and technological innovation in achieving ‘genuine’ competitiveness in world markets. As President ‘Lula’ da Silva memorably put it, Brazil “will never again be a supplier of raw materials for the world market” but become instead “the great technological and environmental power of the 21st century”.⁵³

This goal constituted more than the culmination of a shift towards structural competitiveness that had started in the mid-1980s. Importantly, it powerfully resonated with Brazil’s version of exceptionalism based on the belief that its size and natural wealth were a guarantee of its future political greatness and world power status.⁵⁴ Of course, Brazilian exceptionalism did not emerge during the 1990s; earlier state-building efforts were particularly noticeable for obfuscating the existence of different peoples and, compensating for the supposed lack of a past comparable to that available to European and indeed Indian nation-builders, relied excessively on the vast promise of its abundant natural wealth. Once the exceptionalist discourse of ‘the land of the future’ became part of the official state ideology in the 1930s, aiming for national greatness and power status would be actively exploited by all consecutive governments to justify the socio-economic orientation of the day; currently, this discourse finds expression in the goal of making Brazil the world’s leading ‘natural knowledge economy’.⁵⁵

⁵¹ PITCE, Diretrizes de Política Industrial, Tecnológica e de Comércio Exterior, 26 de Novembro de 2003 (The Industrial, Technological and Foreign Trade Policy of 2003), Government of Brazil.

⁵² My translation, PITCE, p.4.

⁵³ My translation, Lula da Silva, *Presidential Address*.

⁵⁴ Carvalho, *Dreams Come Untrue*.

⁵⁵ Kirsten Bound, *Brazil: The Natural Knowledge Economy* (London: Demos, 2008).

The shift in the orientation of the Indian state was gradual but, like Brazil's, decisive, and all the more radical for being a rather more internal affair. As its foreign exchange reserves and balance of payments situation deteriorated, twice in the space of ten years (1981 and 1990) was the Indian state negotiating loan packages with the IMF, but in neither of these occasions was it subjected to the kind of adjustment programmes visited on other developing countries. In both cases, the Indian state only selectively implemented certain policy reforms and, importantly, many of those undertaken were already planned by the government at the time.⁵⁶ In other words, the IMF was pushing against an open door and neither the IMF, nor the US – aware of changes taking place internally – exerted excessive pressure on the Indian government.⁵⁷ Internal and rather modest liberalisation reforms had begun in 1980 and continued throughout the decade less with the aim of external liberalisation and rather more with improving the growth chances of Indian big business that during this period largely supported the thrust of the reforms and the change in the role of the state they bought about.⁵⁸ But the shift towards international competitiveness that started with the 'big bang' reforms of 1991 was not engineered by the more outward-looking business sectors but by the Indian state itself, or, more accurately, by a powerful fragment within it consisting of a core executive-technocratic elite⁵⁹ that played a fundamental role in seeing it through.⁶⁰ In other words, the vision of India as a competitive economy participating in world markets was a state project, an elite coup formulated within the Indian state and carried out by a small group of reformers initially on a surprisingly thin support base.⁶¹

⁵⁶ Baldev R. Nayar, 'The Limits of Economic Nationalism in India' *Asian Survey*, 40:5 (2000): 792-815; Atul Kohli, 'Politics of Economic Growth in India, Part I & II' *Economic and Political Weekly*, 6 (2006), pp. 1361-1370.

⁵⁷ Nayar, *Economic Nationalism*; Rahul Mukherji, 'Ideas, Interests and the Tipping Point: Economic Change in India', *Review of International Political Economy* 20: 2 (2012), pp. 363-389.

⁵⁸ Vivek Chibber, 'Organized Interests, Development Strategies, and Social Policies', R. Nagaraj (ed) *Growth, Inequality, and Social Policy in India* (London: Palgrave MacMillan, 2012), p. 168-192.

⁵⁹ This included L. K. Jha, Abid Hussain, Shankar Acharya, Montek Singh Ahluwalia and the long-serving Manmohan Singh, many of whom had been involved in the reforms of the 1980s.

⁶⁰ Mukherji, *Tipping Point*; Kohli, *Growth in India*; Nayar, *Economic Nationalism*.

⁶¹ Kohli, *Growth in India*; Chibber, *Development Strategies*; Mukherji, *Tipping Point*.

The new competitiveness orientation came to be justified as seeking nothing less than securing India's destiny, an intentional reference to Nehru's 'Trust with Destiny' speech made at the eve of independence. As Manmohan Singh, one of the key architects of the reforms, put it "India's economic destiny is safe only when India knows how to stand on its own feet, to compete against everyone in the world on an equal footing. That is what we are trying to do".⁶² Frequent appeals to the nationalist notion of *swadeshi*⁶³ were also made, now redefined as "going out in the world and winning ... India can be great only when we become an economic superpower... we can be great by being able to compete".⁶⁴ As in Brazil, succeeding in this task was based in no small measure on hopes that the scientific, technological and industrial capacities developed until then would provide the basis on which to compete in the new knowledge economy. As the Minister of State noted in 1996, the time had come for India "to use the industrial base build up mainly for the domestic market over the preceding 30 years to move out into world markets".⁶⁵ Moreover, unlike in Brazil, reformers could legitimise the new orientation not simply by appealing to an exceptional future, but also to an exceptional past in which India had already been a global *knowledge* power, bestowing to the world the modern number system, astronomy, Ayurveda medicine, and so on.⁶⁶ Explicitly articulated before – e.g. in the Prime Minister's vision of transforming India into a knowledge society in 2000 – India's global vision of becoming a competitive knowledge economy emerged unmistakably in the government's 'Vision for the New Millennium' in 2003. It confirmed that the vision of India becoming one of the top five global knowledge powers by 2020 was now official policy.⁶⁷ As a state project, the vision of

⁶² Quoted in Alamgir, *India*, p. 81.

⁶³ *Swadeshi*, roughly translated as 'of one's own country' retains various interpretations most of which insist upon the value of the local over the remote.

⁶⁴ Yashwant Sinha, the Finance Minister in 1998, quoted in Nayar, *Economic Nationalism*, p.807.

⁶⁵ Chaturvedi, quoted in Peter Drahos *The Global Governance of Knowledge* (Cambridge: Cambridge University, 2010), p. 213.

⁶⁶ Kaushik S. Rajan, *Biocapital: The Constitution of Postgenomic Life* (Durham, NC.: Duke University Press, 2006); Alamgir, *India*.

⁶⁷ Krishna, *India*; Government of India, *Science, Technology and Innovation Policy*, Ministry of Science and Technology, New Delhi, 2013.

India becoming a competitive player in the global knowledge economy would provide some direction and coherence for the various institutional reforms undertaken; it is indeed remarkable that in an otherwise conflictual political scene, governments of different political persuasions have shown an unwavering commitment to this orientation.

3. Towards becoming competitive knowledge economies

Despite the strong nationalist discourse used to legitimise the new competitive knowledge economy orientation, we have seen that when the state in both India and Brazil was searching for a new growth regime in the late 1980s and 1990s, it developed not an original strategy but instead embraced the same orientation that had been first adopted by the US state. But in both India and Brazil the vision of becoming ‘competitive knowledge powers’ has been distinctive and locally-refracted; in the discursive sphere, this is perhaps most notable in the manner in which this orientation has been co-articulated with nationalist and exceptionalist sentiments, a clear manifestation of the enduring role these play in post-colonial states’ efforts to legitimise an existing or, as in this case, a changing socio-economic orientation. While the co-articulation of strong nationalist sentiments with an orientation geared towards becoming competitive knowledge economies in the global marketplace may appear contradictory at first sight, this needs not be so. Not only are heightened expressions of nationalism and exceptionalism crucial for legitimising the new orientation, but also for marshalling the much higher levels of societal mobilisation the new orientation appears to require. Whether leading to national pride or, rather more likely, to national soul-searching, ‘going out and winning’ the global competitive race functions in practice as a perpetual

mobilising vision that sanctions whatever changes to social, cultural and economic practices are called forth in its name.

Indeed, as noted earlier, the competitive knowledge economy orientation demands that the state does more rather than less; states may succeed and/or encounter difficulties in changing various aspects of their socio-economic conditions in pursuit of the competitive knowledge economy orientation but, if they are to succeed, they have no choice but to attend to the long list of tasks at hand. Dutifully, the Indian and the Brazilian state embarked on a whole raft of institutional reforms in order to accomplish their new orientation; while the nature and outcomes of these reforms – too complex to meaningfully discuss here – reflect the distinctive and differently constituted terrains in which they have unfolded, they share in common a tendency to emulate the spirit and often the form of institutional arrangements of what is perceived to be the most successful competitive knowledge economy: the US. Their emulative character is particularly noticeable in and can be demonstrated by briefly focusing on those reforms aimed at creating and maintaining the necessary conditions enabling knowledge to function as commodity/capital which, as we have seen, is a central feature of the knowledge economy orientation.

As in the US (initially), establishing such conditions has been attempted in both countries in large part through the radical redrawing of boundaries between public and private knowledge via reforms to the IP regime and the role of universities and public research institutes. Significant changes to S&T policies were introduced in the 1980s in both India and Brazil when various policies managed by different parts of the state were brought under the control of a newly-established Science and Technology Department in India (1985) and of the new Ministry of Science and Technology in Brazil (1985), both re-organisations clearly aimed at shifting the focus of earlier S&T policies towards achieving innovation-based global

competitiveness.⁶⁸ This shift in S&T policies closely followed that in the US where the new knowledge economy orientation was achieved, among other things, through changes to the IP regime and re-orientating S&T policies during the 1970s and early 1980s.⁶⁹ Of particular interest here is the manner in which such re-orientation was predicated upon US universities becoming actively involved in re-establishing the US' competitive and technological leadership position,⁷⁰ deepening in the process the transformation of knowledge into a fictitious commodity/asset. A notable institutional innovation in this respect came in the form of a range of programmes to support industry-university partnerships created to improve US' global competitiveness.⁷¹ Concerns about the ownership of IP titles over research outcomes arising from federally-funded programmes such as these were addressed decisively in the 1980 Bayh-Doyle Act.⁷² Importantly, this Act signalled the point in time when the established 'open science' principle for publically-funded research predominant during Fordism was abolished and, by allowing public research bodies to privately own IP titles, opened the way to the appropriation and commercialisation of hitherto freely-available academic research. Once publically-funded research outcomes became enclosed in IP titles, many were sold to companies, public research institutions set up joint-ventures with the latter to exploit them and university spin-offs proliferated,⁷³ developments which alongside the radical changes in the US IP regime initially and the international IP regime later, heightened the transformation of knowledge into commodity and capital worldwide.

Not only were they aware of these changes, but the Indian and the Brazilian state contributed to them through undertaking similar reforms in pursuit of becoming competitive

⁶⁸ Cassiolato and Schmitz, *Hi-Tech for Industrial Development*; K. J. Joseph and Dinesh Abrol "Science, Technology and Innovation Policies in India" in José E. Cassiolato and Virginia Vitorino (eds) *BRICS and Development Alternatives: Innovation Systems and Policies* (London: Anthem Press, 2009), pp. 101-131.

⁶⁹ Elizabeth Berman, 'Not Just Neoliberalism: Economization in US Science and Technology Policy' *Science, Technology & Human Values* 39, 3 (2016), pp. 397-431.

⁷⁰ Berman, *Neoliberalism*.

⁷¹ For instance, e.g. the 1977 National Science Foundation SBIR programme; see Weiss, *America Inc.*.

⁷² Berman, *Neoliberalism*.

⁷³ Coriat *et al.* *The Hardship of Nations*.

knowledge economies. Following the creation of the new Science and Technology Department, and especially post-1991 reforms, it became clear that the Indian state had practically abandoned the earlier goal of building a strong and self-sufficient domestic technological base towards transforming the latter into a platform for succeeding in the new global knowledge economy.⁷⁴ Because the more technologically advanced sectors of the economy were under the control of the state, it was successful state-owned enterprises, research institutes and universities that were the first to be called upon to contribute to India's competitiveness. As the Secretary of the Department of Scientific and Industrial Research, R. A. Mashelkar, stated in 1996, now was the time to turn India's "intellectual prowess into knowledge and wealth".⁷⁵ Like Cardoso's self-nomination as the articulator of the new Brazilian state, Mashelkar (and his team) used various governmental positions related to S&T and IP to make public R&D more responsive to India's international competitiveness agenda. Nowhere was the redefinition of the purpose of academic research to serve commercial and competitiveness interests more visible than in the transformation of India's Council for Scientific and Industrial Research (CSIR) – one of the world's largest networks of public research labs – which Mashelkar led from 1995 to 2006. During this period, CSIR clearly shed its earlier responsibility of working towards improving indigenous technology towards engineering India's scientific and technological priorities for a more global market-driven agenda.⁷⁶

The broader reorientation of publically-funded R&D towards improving global competitiveness went hand in hand with reforms towards 'modernising' India's IP system. While up until that point, much like the Keynesian states in the frontier economies, the Indian state had sought to harness knowledge's contribution to economic growth not through the commodification of knowledge via IP but primarily through considerable public

⁷⁴ Joseph and Abrol, *Innovation Policies in India*; Krishna, *India*.

⁷⁵ Quoted in Drahos, *Governance of Knowledge*, p. 220.

⁷⁶ Rajan, *Biocapital*.

investment in 'big science', it now saw the modernisation of the domestic P regime as central to India becoming a competitive knowledge economy.⁷⁷ It made considerable efforts from the mid-1990s onwards to drum up support for a 'robust' IP regime in key but largely apathetic scientific communities – e.g. through setting up facilitating IP cells across departments, universities and public research institutions promoting the new 'patent or perish' mantra – accompanied by even more strenuous efforts to bring about such a robust regime in effect amidst strong opposition by a number of domestic groups.⁷⁸ Far from merely meeting the international obligations it had contracted upon accepting the 1995 WTO TRIPS Agreement, the changes to the domestic IP regime proposed by the Indian state were aimed for the most part at expanding and strengthening the remit and reach of IP titles with a view to facilitating the transformation of knowledge as commodity/capital, a seeming prerequisite for competing in the global knowledge economy.

Its commitment to playing and winning the global IP race is visible not only in its steadfast position in various IP contests that erupted domestically during the 1990s and 2000s when the most important changes to the domestic IP regime were carried out, but also in its successful attempts to join a rather small league of countries whose IP offices function as international searching authorities.⁷⁹ In its pursuit of transforming the domestic IP regime in line with the new goal of India becoming a globally competitive knowledge economy, the Indian state also took a number of other measures; the Protection and Utilisation of Public Funded Intellectual Property Bill (2008) and the National Innovation Act (2008) stand out for having been moulded in the fashion of the US Bayh-Dole Act and America Competes Act (respectively). Although not yet passed into law, the 'Indian Bayh-Dole' 2008 Bill would make it *mandatory* that public research institutes use IP titles to exploit commercially innovations arising out of publically-funded research, a move that is hoped would further

⁷⁷ Author 2015

⁷⁸ Author 2015.

⁷⁹ Among developing countries, India, Brazil and China stand out for enjoying the ISA status under the Patent Cooperation Treaty; see Drahos, *Governance of Knowledge*.

spur innovation as it is believed to have done in the US. Apart from their emulative nature, what is noteworthy in these reforms is the ambivalent attitude of the Indian state towards global IP rules, seeing them simultaneously as an instrument of neo-colonialism triggering strong nationalist sentiments at home while adopting them as a tool of promoting a culture of innovation as the path to realise India's global ambition.⁸⁰ But despite the fact that reforms of the domestic IP system are justified on account of making India a successful knowledge economy and enabling *Indian* firms to benefit from knowledge monopolies domestically and globally, the largest number of patents and other IP titles granted in India so far belong to foreign entities.⁸¹ An important caveat worthy of note here is that the most prolific domestic IP title-holders in India are not Indian private companies but, in line with their new market-oriented mission, government departments, state-owned companies and public research laboratories, CSIR the most significant player of them all.⁸²

In addition to sanctioning stronger IP rights and owning a significant share of domestic IP titles itself, the Indian state sought to further leverage the strengths of the public research system to enhance science-based innovation and global competitiveness through rather narrow, supply-orientated measures which included incentives to commercialise innovation, numerous R&D tax incentives and a range of state-financed programmes reminiscent of those implemented by the US state.⁸³ Somewhat more explicitly than the latter, the Indian state has made no secret neither of its aim to redraw the public-private knowledge boundaries in line with its new orientation, nor of its role in steering S&T investment so as to "benefit innovation making".⁸⁴ Radically breaking with the past growth regime in which public bodies were the stronghold of the national innovation system and the role of FDI was

⁸⁰ Rajan, *Biocapital*.

⁸¹ Dinesh Abrol, "Where is India's Innovation Policy Headed?" *The Social Scientist*, 41: 3-4 (2013), pp. 65 – 80

⁸² Author 2015

⁸³ E.g. the Science and Technology Entrepreneurship Parks in the 1990s, Small Business Innovation Research Initiative (2005) and Funds for Accelerating Start-Ups in Technology (2008).

⁸⁴ Abrol, *India's Innovation*, 66

severely restricted,⁸⁵ ‘innovation making’ is not to be achieved solely by the state and public bodies but by the active engagement of private markets actors, especially foreign ones, in close collaboration with public research institutes and universities. Considerable publically-funded incentives have been offered to Indian entities to cooperate with foreign companies unencumbered by any kind of coordination over technological transfer; these have indeed generated numerous collaborations but they have tended to be financial in nature so that while for every financial collaboration in 1977 there were 8 technological ones, by 2001 this number had fallen to 0.1.⁸⁶ Whether this and other policies and reforms undertaken will succeed in making India one of the top five global knowledge powers by 2020 or, inversely, simply accelerate the absorption of its existing ‘pockets of excellence’ in global R&D networks remains an open question at this juncture.

Although justified on a similarly strong nationalist catch-up discourse, Brazil’s earlier growth regime, unlike India’s, had been much more open, a characteristic which had put many dynamic sectors of the economy in the hands of foreign companies that, as it turned out, were not notable for being research-intensive.⁸⁷ Despite the fact that the break with the past in terms of FDI policy was not as radical as in India, the new competitive knowledge economy orientation nonetheless occasioned a considerable shift: Cardoso’s ‘competitive insertion’, for instance, was predicated among other things on the neoliberal mantra that knowledge could be acquired like any other commodity in the market and achieved through the wider opening of the economy, the provision of stronger IP rights and liberalisation of FDI flows.⁸⁸ Lured among other things by changes in S&T policies and the IP regime, FDI did flock to Brazil in the 1990s, raising its share to GDP dramatically from a historic average

⁸⁵ Krishna, *India*; Abrol, *India’s Innovation*.

⁸⁶ Joseph & Abrol, *Innovation Policies in India*, p. 113.

⁸⁷ José E. Cassiolato *et al.*, “Transnational Corporations and the Brazilian National System of Innovation” in José E. Cassiolato, *et al.* (Eds.) *Transnational Corporations and Local Innovation* (Abingdon: Routledge, 2014), p. 68-132

⁸⁸ Luciano G. Coutinho, ‘Macroeconomic Regimes and Business Strategies’ in José Cassiolato *et al.* (eds.) *System of Innovation and Development: Evidence from Brazil* (Cheltenham: Edward Elgar, 2003).

of 10% to around 25% by the late 1990s.⁸⁹ But because the concomitant rise of neoliberalism and financialisation transforming global economic structures from the early 1980s unleashed not the Schumpeterian instinct amongst market players but rather the predatory-rentier one, most of the FDI simply went towards strengthening foreign control of existing assets in the economy via M&As,⁹⁰ raising similar questions regarding the likelihood of Brazil becoming *the* technological power of the 21st century.

As in India, the earlier state orientation in Brazil had relied little on IP policy and rather more on considerable public investment in science and technology that had resulted by the 1980s in a relatively impressive domestic S&T base, but one whose success was limited to a few high-tech ‘pockets of excellence’ concentrated mainly on public hands. Hence, it was successful public research institutes and universities that were the first to experience the pressures of the new competitiveness orientation. The Brazilian state had started since the late 1970s to push public research institutes and universities towards playing a more active role in improving Brazil’s economic fortunes, a stance that was strengthened and invigorated during the late 1980s and 1990s as the competitiveness orientation was taking hold.⁹¹ Perhaps the most notable transformation in S&T policies along these lines occurred in FINEP,⁹² the most important public innovation agency in Brazil. In light of the new state orientation, FINEP’s mission was clearly re-orientated away from academic and basis research towards financing industrial technology research in the 1990s with a view to facilitating Brazil’s competitive insertion in the global economy.⁹³ Likewise, the symbol of Brazil’s excellence in agricultural research, Embrapa,⁹⁴ also reformulated its mission as a

⁸⁹ Cassiolato, et al. *Transnational Corporations*, p. 80.

⁹⁰ José G. Palma *Brazil’s Recent Growth*. UNCTAD and South Centre Discussion Paper No. 3 (Geneva: UNCTAD, 2012).

⁹¹ Schwartzman, *Science and Technology*.

⁹² FINEP, the Funding Authority for Studies and Projects, created in 1967 with the goal of financing modernisation and industrialisation projects.

⁹³ Schwartzman, *Science and Technology*.

⁹⁴ Embrapa, the Brazilian Corporation for Farming and Livestock Research, was created in 1973 to organise and expand public research on agriculture that until then had been decentralised.

state-owned corporation to include in the mid-1990s the imperative of obtaining profits from the exploitation of its publically-funded research outcomes and establish Brazil as a leader in global agro-biotech markets.⁹⁵

Among other reforms undertaken with a view to making research carried out in universities and public institutes more directly relevant to Brazil's competitiveness, the Innovation Law passed in 2004 is notable for giving public research institutes and universities the right to commercially exploit patents and other IP titles on publically-funded research. Directly inspired by the US 1980 Bayh-Dole Act, the law complemented the radical overhaul of Brazil's domestic IP regime in the 1990s and 2000s and was in line with the commitment of the Brazilian state towards a knowledge economy project that, like in the US, was dependent on the increasing commodification and exploitation of knowledge through the ratcheting up of private IP rights. Although the TRIPS agreement allowed developing countries a transition period until 2005 to fully comply with its obligations, unlike India's, the Brazilian state moved relatively fast to reform its domestic IP regime in the mid-1990s, driven by the assumption that a 'robust' and 'modern' IP system would help Brazil's new growth strategy by attracting FDI flows, speed up technological upgrading and in time increase IP titles and rents accrued to Brazilian entities. The new IP law approved at the beginning of Cardoso's first term in 1996 was not only premature but, in line with these assumption, also considerably more generous to IP-holders than the TRIPS agreement itself.⁹⁶

The Brazilian state's efforts to strengthen its domestic IP system amidst strong domestic opposition so as to enable Brazil to become a winner in the global IP race were seemingly vindicated when its patent office was granted the international searching authority status under the Patent Cooperation Treaty in 2007, the same year as India's. Nevertheless, despite

⁹⁵ Felipe Filomeno *Monsanto and Intellectual Property in South America* (Basingstoke: Palgrave MacMillan, 2014).

⁹⁶ See Lei nº 9.279 of 1996, available at <https://presrepublica.jusbrasil.com.br/legislacao/91774/codigo-de-propriedade-industrial-lei-9279-96>; for an analysis, see Author 2018.

hopes that Brazilian entities would join and succeed in the global IP race, the relative share of Brazilian patent applications after the new 1996 IP law took effect actually fell compared to the pre-1996 period.⁹⁷ Like India, Brazil is a net-importer of IP titles for despite rapid increases in the number of IP titles granted domestically, most go to foreign companies.⁹⁸ Notably, as in India, most of the domestic IP titles granted to Brazilian entities are not in private hands, but, following their reorientation in light of the new goal of Brazil becoming a competitive knowledge economy, in the hands of public research institutions and state-owned corporations. Embrapa, for instance, is the main market player in agro-biotech, controlling nearly 41% of all protected plant cultivars in the Brazilian market;⁹⁹ the state-owned Petrobrás and the public university of Campinas in São Paulo are also notable domestic IP titleholders.

Although public research institutes and state agencies in advanced economies are also key players in domestic and global IP markets, the majority of domestic IP titles there are owned by private entities. While distinct, the phenomenon of the state in India and Brazil being at once the knowledge market creator (via the sanctioning of IP titles) and the largest player in such markets domestically is fully in line with the new competitive knowledge economy orientation and the fact that those parts of the economy that were best positioned to contribute to it were and remain largely public. While the appearance of these public entities in global IP rankings certainly contributes to strengthening national pride, the extent to which the commodification of knowledge and its enclosure in nominally public IP assets will contribute to India and Brazil achieving the great knowledge power status remains unclear. So far, as noted briefly in this section, reforms of the conditions under which knowledge is generated, circulated and exploited are not notable on account of constituting original institutional innovations towards enhancing structural competitiveness or becoming

⁹⁷ Cassiolato, et al. *Transnational Corporations*, p. 97.

⁹⁸ Data from the INPI BADEPI version 1.1 database, collected and analysed by Dr. Leonardo Costa Ribeiro of INMETRO, in file with author.

⁹⁹ Filomeno, *Monsanto*.

knowledge economies. Generally, and in line with the Schumpeterian state orientation of most frontier economies, S&T policies in both India and Brazil continue to contribute to the commodification of knowledge, alongside the ever-growing number of IP titles granted and other measures aimed at facilitating the smoother functioning of knowledge and IP markets.

4. Concluding thoughts

Despite hopes pegged on the competitive knowledge economy orientation and extensive institutional reforms underpinning it, the record of the post-Fordist growth regime in advanced economies has so far been characterised by low investment, productivity and growth rates, deindustrialisation, environmental crisis, increased societal tensions and inequalities. Such record notwithstanding, the Indian and the Brazil state have so far not proposed other alternatives to that of transforming themselves into competition states of sorts. Not only is this a problem in light of the relatively poor record of the new growth regime, but also because as observers of catch-up development at least from Gerschenkron onwards have been arguing, as changes to global competition brought about by more advanced economies alter the horizon of how to catch-up and strengthen one's position in the global market for developing countries, so must their discursive and institutional strategies needed for success. As noted, the new orientation towards becoming successful competitive knowledge economies has been built discursively in both India and Brazil on strong nationalist and exceptionalist sentiments that do not find a direct match in more advanced economies. The institutional reforms undertaken to achieve this goal, however, have often sought to imitate those undertaken in the US, considered the most successful

knowledge economy. As argued, both the Indian and the Brazil state chose to embrace the new competitive knowledge economy orientation as developed in advanced economies and neither state has so far imagined alternatives or developed original institutional innovations that might enable them to transcend the existing obstacles or take advantage of the new opportunities that changes in the global economy from the late 1970s have generated.

Saying that a choice was made by the Indian and the Brazilian state does not ignore the existence of pressures and constraining factors, but points to the taking of a particular position within a context that is not only (indeed, by definition, always) constraining, but also where alternative positions are possible. Instead of undertaking reforms towards preparing and turning ever-larger parts of their societies' energies over to the global competitive treadmill, the continental size of their economies and the long-list of social needs for large parts of their population – e.g. access to decent housing, education and healthcare, food security, good working conditions, and adequate social protection – makes a heterodox social knowledge economy vision possible. A knowledge economy that makes meeting these needs simultaneously the means and the ends necessitates, in turn and at the very least, institutional innovations that counter the tendency of market players to generate innovations based on short-term returns and directs them towards meeting social needs sustainably, that direct finance towards job-creation in sustainable productive processes, that replenish the 'knowledge commons' and stimulate much wider access to it, that invest on and upgrade the competencies of low-skilled workers, that enhance respect for the independence of non-economic forms, that promote collective solutions and, importantly, institute distributional policies that share economic dividends widely. Provided they are willing to experiment, only in pursuit of such a social vision may the Indian and Brazilian state take advantage of existing windows of opportunity to realise the hitherto elusive promise of the knowledge economy. If they succeed, even in part, heterodox socio-economic visions may become possible and acceptable not only to other, less influential developing

countries, but to all countries or regions affected by the poor economic, social and environmental record of the current competitiveness state orientation.